高等工业学校

《英语》教学参考资料

第二册

凌渭民主編

商务印书館

内容提要

本书是配合高等工业学校《英語》第二册的内容而編写的，供教学参考之用。其内容有：分析讀課文、綜合讀課文和总复习課文的譯文；課文练习和語法练习的答案。譯文和答案都是参考的性質，而不是唯一的标准。

书中一切資料主要供教师参考。

本书由凌渭民主編，参加編写工作的除凌渭民外还有方維敏、邹人杰和张彭年諸同志。

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第二册
凌渭民主編

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Contents

Lesson 1

WHAT IS SCIENCE?

什么是科学？

TRANSLATION 〔譯文〕

科学是由研究或实践所获得的系統知識。在科学上我們必須有許多証明了的事实，但是科学不仅是許多仔細收集起来的事实的累积，而也是一种解答問題的方法。

当一个科学家着手解答一个問題时，他是这样进行的。第一，他把問題叙述清楚；第二，他收集他所能发現的有关問題的一切事实；第三，他保持这些事实的仔細記录；第四，他研究这些事实，为了求得解答这个問題的綫索。他把由这些綫索所指示的一个可能的解答或几个可能的解答說成是暫时的，还有待于从更多的观察和实驗两个方面或者从其中一个方面来进一步加以检驗。他要把每一个答案检驗許多次。

最后，他得出了一个符合所有已知事实的答案。他就說这个答案是結論。甚至于这个还不是最終結論，因为他在下一步将他的結論提交同道的科学家，通过新的实驗和新的观察，两个方面或者从其中一个方面来更进一步地加以检驗。为了适合新的事实，他的結論或許需要改变。只有在核对、再核对、重新再核对之后，一个結論才最后认为是正确的。即使这样，如果出現新事实（出現新事实是常事），这个結論在将来可能还要修改。

你可以毕生用这个同样的方法来解答你的一切問題。这个方法正确地称为科学方法，并且是科学的眞正基础。在这个意义上，科学是一种解答問題的方法，也是一种知識的累积。

KEY TO EXERCISES TO THE TEXT

Exercise 1 (p. 3)

1. Science means systematic knowledge possessed as a result of study or practice.
2. A scientist must keep careful records of all the facts collected before he studies them.
3. A scientist studies his facts for clues that may lead to the solution of a problem.
4. In his study of facts he must arrive at a solution which agrees to all the known facts.
5. Only after being checked and rechecked and rechecked again will his conclusion be accepted as true.
6. His conclusion has to be revised if new facts come to light.
7. The scientific method means that we should solve problems through careful collection and study of facts and come to a conclusion by observations or experiments, or both.

Exercise 2 (p. 3)

1. 出現
2. 检驗一个結論
3. 用这种方法进行
4. 毕生
5. 綫索所指示的暫时解答
6. 公认为正确的結論
7. 不仅只是事实的累积
8. 由研究所获得的系統知識
9. 解答問題的一种綫索
10. 把結論說成是暫时性的

Exercise 3 (p. 3)

1. in this sense
2. to do correct records
3. to arrive at the final conclusion
4. to start out to do experiments

5. a checked record
6. the conclusion that agrees to new facts
7. knowledge possessed as a result of observations
8. to submit these data to this scientist
9. the data related to our problems

Exercise 4 (p. 4)

1. experiment
2. science
3. system
4. solution
5. care
6. study
7. knowledge
8. practice

Exercise 5 (p. 4)

1. With an accumulation of data we can start out to do scientific research.
2. The facts related to these problems must be carefully studied.
3. Through further observations and experiments this conclusion may have to be revised.
4. Ten years ago we could solve our problems in this way, but now we cannot do so.
5. Before this conclusion has been revised, you must not make it public.

KEY TO GRAMMAR EXERCISES

Exercise 1 (p. 7)

1. could (能)
2. can (能)
3. may (可以)
4. can (可能)
5. must (必須)
6. may (可以)
7. must (not) (不許)
8. can (能)
9. must (必須)
10. might (或許)

Exercise 2 (p. 8)

1. May I use this electronic computer? No, you mustn't.
2. Experiments have been finished without any mistakes, we need not do them again.
3. Only the electronic computer can make correct and rapid computations.
4. With the help of scientific knowledge many problems can be easily solved.
5. To achieve good success, you must work hard.

Lesson 2

THE FIRST ELECTRIC LIGHT

第一盏电灯

TRANSLATION 〔譯文〕

湯麦斯·阿尔伐·爱迪生想制造一种室內使用的电灯以代替煤气(灯)。他早已断定粗的縫級綫能加热成为輸送电流的一种碳化綫。其后，这碳化迴綫必須封入薄玻璃灯泡內，再抽去空气。等电流通上时，灯泡內的碳化綫就会放光。这样，电灯就做成了。

但如何来加热这种綫呢？这不是件容易的事。綫必須放在模子里然后在炉內加热。当它热上几个小时，而到达指定的溫度时，就从炉內取出使冷却。要从模子里取出它而不折断，再将它封入薄玻璃灯泡內，需要高度技巧。

爱迪生与他的工作人員在实驗室中辛勤地工作着。一夜又一夜地过去了。他們折断了許多碳化綫，然而他們毫不失望。每当碳化綫折断时，爱迪生总是說："我們再做一个。"

終于，从模子中取出了碳化綫而沒有折断，而且成功地封入了一个眞空的薄玻璃灯泡內。

"现在我們来試一下，"爱迪生說。

在接上电流去試灯之前，所有的工作人員都已圍住了他，寂靜无声。当这小小的灯散发出它的光芒时，他們都高兴极了，整个晚上他們兴趣浓厚地看守着这盞灯。接着又是一夜，他們不願离开实驗室。这盞灯已点了 40 小时，但仍然在放光。第一盞电灯成功了。

KEY TO EXERCISES TO THE TEXT

Exercise 1 (p. 10)

1. Gas or oil lamps were used before the electric light was invented.
2. Edison intended to make an electric light to be used in houses instead of gas.
3. A heavy sewing thread can be made to carry the electric current when it is carbonized.
4. A loop of carbonized thread can be made by putting a heavy sewing thread in a mould, heating it in a furnace to a specified temperature, then taking it out of the mould after cooling.
5. It was not an easy job to produce a loop of carbonized thread because the loop was easily broken when it was taken out of the mould.
6. We learn from the story that success lies in perseverance and patience.

Exercise 2 (p. 10)

1. 想做
2. 使用一物以代替另一物
3. 从一只玻璃灯泡里抽出空气
4. 带有电流
5. 一圈碳化迴綫
6. 加热到指定的溫度
7. 要求高度技巧
8. 聚集到某人周围
9. 深沉的寂靜
10. 带着浓厚的兴趣注視 (看守) 着

Exercise 3 (p. 11)

1. night after night
2. to send out glow
3. to turn on the electric light
4. by no means to lose heart
5. to gather round him
6. to use electricity instead of gas
7. to be turned into a carbonized thread
8. to be sealed in a thin glass bulb
9. to take it out of the furnace and cool it
10. to take the loop of carbonized thread out of the mould unbroken

Exercise 4 (p. 11)

1. Edison and his men invented the electric light after they had made many experiments.
2. After a heavy sewing thread had been put in a mould, they heated it in a furnace.
3. After a loop of carbonized thread had been sealed in a thin glass bulb, they started out to pump out the air.
4. They did not think of rest until the little electric light (had) glowed.
5. By six o'clock this evening, the light will have burned for twenty hours.
6. Edison and his men persevered in their work many days and failed many times before they invented the electric light at last.

Supplementary Reading

THOMAS ALVA EDISON

湯麦斯·阿尔伐·爱迪生

TRANSLATION 〔譯文〕

湯麦斯·阿尔伐·爱迪生是他那时代最伟大的发明家之一。他与其說是一个理論家，还不如說是一个实驗家兼实践家。

爱迪生在十二岁时就开始謀生。他做过鉄路上的报童，这是他的第一个职业。在他首次来到底特律时，他参观了公共图书館，一排一排的书籍給他留有很深的印象。

当他十五岁时，他在他那火車的行李車廂里建立了一个"实驗室"。那时沒人知道他在那里做什么。这孩子对他所有的实驗做了井井有条的記录。

有一天，爱迪生救了一个在鉄路上玩耍的孩子的性命。那个孩子的父亲是个报务員。从此他就教爱迪生电报学。在这以后五年間，爱迪生担任了报务員工作。

1868 年，爱迪生制成了他的第一件发明物——一架电磁装置。

KEY TO EXERCISE TO THE TEXT (p. 13)

1. Edison was known as one of the greatest inventers of his time.
2. He was an experimenter and a practical man more than a theoretician.
3. His first job was that of a railway newsboy.
4. Edison was deeply impressed by the rows and rows of books in the public library. He made up his mind to read all the books.

5. His first "laboratory" was in the baggage-car of his train.
6. His second job was that of a telegraph-operator.
7. His first invention was an electric-magnetic device.

KEY TO GRAMMAR EXERCISES

Exercise 1 (p. 15)

1. had learned
2. got, had already begun
3. had made, started out
4. shall have begun
5. lived
6. had watched and studied, invented
7. had been found, accepted
8. was not accepted, had been revised
9. had solved
10. had chosen, wrote

Exercise 2 (p. 16)

1. By next week, we shall have arrived at a temporary solution of this problem.
2. We did not know the story of the invention of the electric light until we had learned this lesson last week.
3. Soon after new facts had come to light, the conclusion was revised to fit them.
4. Before the conclusion is submitted to other scientists for discussion tomorrow, he will have finished the tenth experiment related to this subject.
5. Three days ago when he had found out some clues, he made a further study of that problem.
6. Yesterday he submitted his solution which he had checked himself to his fellow scientists for rechecking.

Lesson 3

METALS

金　　属

TRANSLATION 〔譯文〕

乔治：金属有許多种，是不是？

教师：是的，有七十余种。假使你想知道，我願意把它們的特性告訴你。

乔治：我很喜欢知道，請讲吧。

亨利：是，我很想听。

教师：好吧。首先让我們考虑一下金属是什么。你們以为你們能区别金属和石头嗎？

乔治：石头！哦，我不会把一块鉄誤认为一块石头。

教师：你是怎样区别它們的？

乔治：金属是明亮发光的。

教师：的确，光亮是金属的一种性质，可是玻璃和晶体也是非常光亮的。

亨利：但是我們能透过玻璃看东西，却不能透过一块金属看东西。

教师：很对，金属是光亮的，但是不透明的。我們所能制造的最薄的金属板也会像一堵石墻一样阻隔光。

乔治：金属又是很重的。

教师：金属一般是很重的，但是有几种金属却比水輕。好，还有什么？

乔治：唔，金属受得住錘的敲击而不会粉碎，一块石头就不行了。

教师：是的，这种在錘击下会伸延的特性称为展性。另外一种和展性相似的特性称为延性，即能拉成为金属絲的这种可能性。金属都有这二种特性，而且金属的所以很有用主要依賴于这二种特性。

乔治：金属还会熔化。

教师：是的，尽管有几种金属比其他金属需要较高的热度才会熔化，然而一切金属都是会熔化的。熔化这种特性称为可熔性。你們还知道其他的有关金属的情况嗎？

乔治：我想，金属是从地下取出来的。除了知道这一点之外，沒有其他了。

教师：这句話讲得很恰当，因为正是由于这种情况使金属列入矿物中。現在，总結一下金属的性质：金属是一种光亮的、不透明的、很重的、可展的、可延的和可熔的矿物。

KEY TO EXERCISES TO THE TEXT

Exercise 1 (p. 19)

1. There are seventy or more kinds of metals.
2. A metal looks bright and shining.
3. A metal bears beating, but a stone does not.
4. Metal can be extended and spread under a hammer because it has malleability.
5. Ductility means the property of bearing to be drawn out into a wire.
6. Much of the use of metals depends upon their malleability and ductility.
7. Fusibility means the property of melting.
8. The character of metal is that of being brilliant, opaque, heavy, malleable, ductile, and fusible.

Exercise 2 (p. 20)

1. 把鉄誤认为鋼
2. 用一块金属板阻隔太阳光
3. 把一根銅棒拉成絲
4. 通过显微鏡看东西
5. 考虑科学研究的条件
6. 把一块金属和一块石头区别开来
7. 讲給他听关于金属的性质

Exercise 3 (p. 20)

1. an opaque crystal
2. the important uses of metal
3. in general
4. to beat into pieces
5. to bear beating
6. the malleability of metal
7. to rank this element among metals
8. to sum up the principal properties of metal

Exercise 4 (p. 20)

1. principal
2. distinguish... from
3. see... through
4. keep out
5. bear
6. drawn out
7. upon
8. In
9. up
10. should

Exercise 5 (p. 21)

1. In general, metals are malleable and ductile.
2. Please sum up the charater of metal.
3. Light cannot pass through metals, because metals are opaque.
4. Try to draw out this metal rod into a wire with machines.
5. Some metals will melt only when heated to high temperatures.

KEY TO GRAMMAR EXERCISES

Exercise 1 (p. 24)

1. shall (将)
2. shall? (可以?)
3. should (应该)
4. would (总是)
5. should (应该)
6. shall (应该)
7. will (将)
8. shall? (要不要?)
9. would (习于)
10. shall (应该)

Exercise 2 (p. 25)

1. I told comrade Wang not to lose heart.
2. You should have courage to overcome difficulties in your work.
3. Let us turn on the electric current two hours later.
4. Leave the laboratory at once.
5. Let him check and recheck his conclusion.
6. He shall have an accumulation of facts for more observations.

Lesson 4

DUST

灰　尘

TRANSLATION 〔譯文〕

人們往往以为灰尘是无用的。但是情况并不常是这样。在許多方面灰尘是有用的。

如果我們让太阳光綫透进窗来，我們可以看到无数的細粒灰尘像黄金那样在发光。假使沒有灰尘，在太阳光綫照到某种东西上之前，我們不可能看見太阳光綫。灰尘反射光，把光向四处散佈。在戶外的情况是同样的，灰尘給我們柔和而舒适的日光。如果沒有灰尘，就会有对于我們有害的很强烈的阳光，或是什么都看不見的一片黑影。

我們向山上爬得越高，在我們周围的灰尘顆粒就越小越輕。这些細粒灰尘只反射蓝色光；正是由于这个原因，山上的晴朗的天空看起来是蓝色的。工业城市上空的粗粒灰尘反射白色光或黄色光。这就是为什么城市的天空看起来并不是很蓝的。

你知道，太阳热使海洋的水变成看不見的水蒸汽，升入空中。上升时，四周围的冷空气使它凝結成云。当这些云因碰到更冷的空气流

而变得更冷时，雨就落向地上。

但是假使空气中沒有灰尘，这个过程就不可能发生。水蒸汽不会凝結成雨点。洪水会落在山边，而低地会成为干燥的沙漠，什么都不能生长。

因此，假使空中沒有灰尘，我們不能在我們的这个地球上生存，因为沒有灰尘就沒有云、沒有雨。所以我們看到灰尘在自然界的演变中起着很重要的作用。

KEY TO EXERCISES TO THE TEXT

Exercise 1 (p. 27)

1. People often think of dust as useless.
2. In a sunbeam passing through a window we can see hundreds of fine grains of dust shining like gold.
3. If there were no dust, there would be very strong sunshine harmful to us.
4. The fine dust reflects only the blue light and the coarse dust, the white or yellow light.
5. The heat of the sun turns the water of the ocean into invisible vapour.
6. Clouds are condensed into raindrops by meeting cold currents of air.
7. If there were no clouds and no rain there would be no living things on the earth.
8. Without dust people could not live on the earth because there would be no clouds and no rain.

Exercise 2 (p. 28)

1. 沒有灰尘不能看見太阳光綫
2. 照到地面上的太阳光綫
3. 有害于人类的健康
4. 由細粒灰尘所反射的蓝色光
5. 升向空中的看不見的水蒸汽
6. 在工作过程中起重要作用

Exercise 3 (p. 28)

1. the part to be played by dust in nature
2. the soft and bright daylight
3. the fine grains of dust reflecting the blue light
4. the cold air around high mountains
5. the invisible vapour in the air
6. the sunbeam passing through a window

Exercise 4 (p. 28)

1. in
2. in
3. in
4. without, on
5. into
6. into
7. In

Exercise 5 (p. 29)

1. If there were no dust, there would be no clouds and no rain.
2. If vapour meets with cold air, it will condense into raindrops.
3. The fine grains of dust reflect blue light, that is why the sky looks blue.
4. If vapour did not condense into rain, many places in the world would become as dry as deserts.
5. The fine grains of dust reflecting sunshine give us soft daylight.
6. Weeks ago if there had been no rain for three or four days, the rice in the fields could not have grown.